REMARKS

This response responds to the Office Action dated February 20, 2003 in which the Examiner rejected claims 1, 12 and 13 under 35 U.S.C. §102(b) and rejected claims 2-11, 14 and 15 under 35 U.S.C. §103.

Claim 1 claims a method of automatically finding one or more answers to a natural language question in a computer stored natural language text database. The natural language text database has been analyzed with respect to syntactic functions of constituents, lexical meaning of word tokens, and clause boundaries. The natural language question comprises a question clause. The method comprises the steps of: first, analyzing a computer readable representation of the question clause with respect to syntactic functions of its constituents and the lexical meaning of its word tokens. In response to the analysis step, a set of conditions for a clause in the natural language text database is defined to constitute an answer to the question clause. The conditions relate to the syntactic functions of constituents and the lexical meaning of word tokens in the clause, identify clauses in the natural language text database that satisfy the conditions, and return answers to the question clause by means of the identified clauses that matches the conditions.

Through the method of the claimed invention a) having a natural language text database which has been analyzed with respect to syntactic functions of constituents, lexical meaning of word tokens and clause boundaries and b) defining a set of conditions for a clause in the natural language text database to constitute an answer to a question clause where the conditions relate to the syntactic functions of the constituents and the lexical meaning of word tokens in the clause, as claimed in claim 1, the claimed invention

provides a method of automatically finding one or more answers to a natural language question that are not domain specific and that deliver answers to questions with high precision. The prior art does not show, teach or suggest the invention as claimed in claim 1.

Claim 13 claims a system for automatically finding one or more answers to a natural language question in a computer stored natural language text database. The system comprises a storage means, analyzing means, defining means and answer finding means. The storage means comprises the natural language text database which has been analyzed with respect to syntactic functions of constituents, lexical meaning of word tokens, and clause boundaries. The analyzing means is for analyzing a computer readable representation of question clause of a natural language question with respect to syntactic functions of its constituents and lexical meaning of its word tokens. The defining means, is operatively connected to the analyzing means, and is for defining, in response to an analysis performed by the analyzing means, a set of conditions for a clause in the natural language text database to constitute an answer to the question clause. The conditions relate to the syntactic functions of constituents and the lexical meaning of word tokens in the clause. The answer finding means is operatively connected to the storage means and the defining means, and is for identifying in the natural language text database clauses that satisfy the conditions and is for returning answers to the question clause by means of the clauses that satisfy the condition.

Through the structure of the claimed invention having a storage means storing the natural language text database which has been analyzed with respect to syntactic functions

of constituents, lexical meanings of word tokens and clause boundaries and having a defining means which defines a set of conditions for a clause in the natural language text database to constitute an answer to the question clause where the conditions relate to the syntactic functions of the constituents and the lexical meanings of word tokens in the clause, as claimed in claim 13, the claimed invention provides a system for automatically finding one or more answers to a natural language question that are not domain specific and that deliver answers to questions with high precision. The prior art does not show, teach or suggest the invention as claimed in claim 13.

Claims 1, 12 and 13 were rejected under 35 U.S.C. §102(b) as being anticipated by *Goldberg et al.* (U.S. Patent No. 5,895,466).

Applicant respectfully traverses the Examiner's rejection of the claims under 35 U.S.C. §102(b). The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, it is respectfully requested that the Examiner withdraws the rejection to claims and allows the claims to issue.

Goldberg et al. appears to disclose in Fig. 2 at step 100, natural language device 30 receives a textual question from a customer at remote device 10. At step 110, natural language device 30 analyzes the question using natural language understanding software. The analysis includes a vocabulary analysis and a syntactic/semantic analysis of the textual question. At step 120, as a result of the analysis of step 110, natural language keys are generated and parameters, if any, are extracted from the text based question. The parameters are included in the text based question. At step 130, it is determined whether all parameters require by the question are received. The required parameters must be

included with the keys when database 40 is queried. If all of the required parameters were determined not to be received at step 130, at step 140 natural language device 30 automatically generates a request to the customer for the missing parameters. If all of the required parameters were determined to be received at step 130, at step 150 database 40 is queried based on the keys generated and the required parameters extracted at step 120. Database 40 includes answers to all known possible customer questions. Previously unknown questions may not have answers stored on database 40 when they are first received by natural language device 30. If so, natural language device 30 will not receive an answer as a result of the query at step 150. Therefore, at step 160 it is determined whether an answer has been received from database 40 based on the query at step 150. If it is determined that an answer was not received at step 160, the answer to the question will typically be manually generated by a customer service employee. This manual answer will be sent to the customer at remote device 10. In addition, at step 170 the manual answer is received by natural language device 30. At step 180, customer service system 50 is trained based on the manually generated answer. (col. 3, lines 1-64)

Thus, *Goldberg et al.* merely discloses that as a result of analyzing the question, using natural language understanding software in step 110, natural language keys are generated and parameters are extracted. Nothing in *Goldberg et al.* shows, teaches or suggests defining a set of conditions for a clause where the conditions relate to the syntactic functions of constituents and the lexical meaning of word tokens in the clause as claimed in claims 1 and 13. Rather, *Goldberg et al.* merely discloses generating natural language keys and extracting parameters from the text based question. In other words, the natural

language keys used in *Goldberg et al.* are generated when queries are analyzed using the natural language device. The keys are merely pointers to answers in the database. The keys do not relate to the answers in the database in any way other then the fact that the answers are indexed to the keys. Thus *Goldberg et al.* does not show, teach or suggest that the keys relate to syntactic functions of constituents and the lexical meaning of word tokens of the answers stored in the database as claimed in claims 1 and 13.

Additionally, *Goldberg et al.* merely discloses a database 40 which stores a plurality of answers to possible customer questions where the plurality of answers are indexed to natural language keys that are generated by natural language device 30 during the analysis of step 110. Thus nothing in *Goldberg et al.* shows, teaches or suggests a natural language text database which has been analyzed with respect to syntactic functions of constituents, lexical meaning of word tokens and clause boundaries as claimed in claims 1 and 13. Rather, the database 40 in *Goldberg et al.* merely stores a plurality of answers to possible customer questions. In other words, the answers in the database 40 in *Goldberg et al.* have not been analyzed with respect to syntactic functions of constituents, lexical meaning of word tokens and clause boundaries as claimed in claims 1 and 13.

Applicant respectfully submits that the *Goldberg et al.* system requires pre-generation of answers to potential questions and indexing them to natural keys. Thus, the system of *Goldberg et al.* is not able to dynamically find answers to new questions for which no answers have been stored and no keys have been indexed to these answers (see col. 3, lines 50-62). However, as claimed in claims 1 and 13, both the natural language text database and the question clause are analyzed with respect to their respective syntactic

functions of constituents and lexical meaning of word tokens and answers are identified based not only on predetermined indexing of a set of answers to keys but also on conditions on a clause in the natural language text database where the conditions relate to the syntactic functions of the constituents and the lexical meaning of word tokens of the clause. Therefore, the natural language text and database of the invention as claimed in claims 1 and 13 is not limited to a set of answers to potential questions but in fact may comprise any natural language text.

Since nothing in *Goldberg et al.* shows, teaches or suggests a) a natural language text database which has been analyzed with respect to syntactic functions of constituents, lexical meanings of word tokens and clause boundaries and b) a set of conditions for a clause are defined relating to syntactic functions of constituents and lexical meanings of word tokens in the clause, as claimed in claims 1 and 13, it is respectfully that the Examiner withdraws the rejection to claims 1 and 13 under 35 U.S.C. §102(b).

Claim 12 depends from claim 1 and recites additional features. It is respectfully submitted that claim 12 would not have been anticipated by *Goldberg et al.* within the meaning of 35 U.S.C. §102(b) at least for the reasons as set forth above. Therefore, it is respectfully requested that the Examiner withdraws the rejection to claim 12 under 35 U.S.C. §102(b).

Claims 2-10 were rejected under 35 U.S.C. §103 as being unpatentable over *Goldberg et al.* in view of *Hedin et al.* (U.S. Patent No. 5,386,556).

Applicant respectfully traverses the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for

reasons which will be set forth below, it is respectfully requested that the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, since nothing in *Goldberg et al.* shows, teaches or suggests the primary features as claimed in claim 1, it is respectfully submitted that the combination of the secondary reference of *Hedin et al.* with the primary reference of *Goldberg et al.* will not overcome the deficiencies of the primary reference. Therefore, it is respectfully requested that the Examiner withdraws the rejection to claims 2-10 under 35 U.S.C. §103.

Claim 11 was rejected under 35 U.S.C. §103 as being unpatentable over *Goldberg et al.* in view of *Hedin et al.* and further in view of *Voorhees* ("Using WordNet for Text Retrieval").

Applicant respectfully traverses the Examiner's rejection of claim 11 under 35 U.S.C. §103. The claim has been reviewed in light of the Office Action, and for reasons which will be set forth below, it is respectfully requested that the Examiner withdraws the rejection to the claim and allows the claim to issue.

As discussed above, since nothing in the combination of *Goldberg et al.* or *Hedin et al.* shows, teaches or suggests the primary feature as claimed in claims 1, it is respectfully submitted that the combination of the primary reference(s) with *Voorhees* will not overcome the deficiencies of the primary reference(s). Therefore, it is respectfully requested that the Examiner withdraws the rejection to claim 11 under 35 U.S.C. §103.

Claims 14 and 15 were rejected under 35 U.S.C. §103 as being unpatentable over *Goldberg et al.* in view of well known prior art.

Applicant respectfully traverses the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, it is respectfully requested that the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, nothing in *Goldberg et al.* shows, teaches or suggests the primary features as claimed in claim 13. Furthermore, Applicants respectfully request a copy of the well known prior art which has not been provided. Even assuming *arguendo* that the well known prior art discloses the use of a computer readable medium and a computer program, it is respectfully submitted since the primary reference to *Goldberg et al.* does not show, teach or suggest the primary features as claimed in claim 13, the combination of *Goldberg et al.* with the well known prior art will not overcome the deficiencies thereof. Therefore, it is respectfully requested that the Examiner withdraws the rejection to claims 14 and 15 under 35 U.S.C. §103.

The prior art of record, which is not relied upon, is acknowledged. The references taken singularly or in combination do not anticipate or make obvious the claimed invention.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason Examiner feels that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

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